

Asynchronous A/D Converter for In Situ Instruments Operating under Extreme Environments

Completed Technology Project (2013 - 2016)



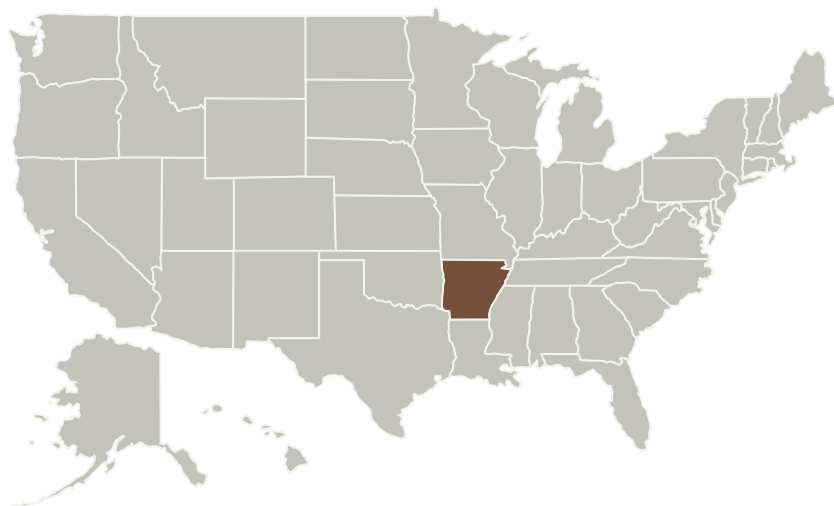
Project Introduction

Space missions often require in situ instruments capable of taking measurements, performing computation/communication, and executing control under extreme environments such as cryogenic temperature and heavy radiation. While external protection mechanisms are currently utilized to isolate the microelectronic circuits incorporated by these instruments from drastic environmental temperature swings in order to avoid system malfunction, they induce additional mass, volume, and power consumption, and reduce reliability. This project will investigate the feasibility of designing advanced microelectronic integrated circuits that can sustain the extreme space environment while maintaining stable and reliable performance without external protection, through the design, fabrication, and testing of an innovative asynchronous analog-to-digital converter, which is a critical component of many space instruments.

Anticipated Benefits

This project investigates the feasibility of designing advanced microelectronic integrated circuits that can sustain the extreme space environment while maintaining stable and reliable performance without external protection.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Space Technology Research Grants

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Organizations Performing Work	Role	Type	Location
University of Arkansas	Supporting Organization	Academia	Fayetteville, Arkansas

Primary U.S. Work Locations

Arkansas

Project Website:

<https://www.nasa.gov/directorates/spacetech/home/index.html>

Project Management

Program Director:

Claudia M Meyer

Program Manager:

Hung D Nguyen

Principal Investigator:

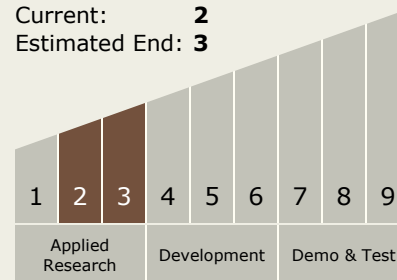
Jia Di

Technology Maturity (TRL)

Start: 2

Current: 2

Estimated End: 3



Technology Areas

Primary:

- TX02 Flight Computing and Avionics
 - TX02.3 Avionics Tools, Models, and Analysis
 - TX02.3.1 Electronics Development Tools